

EXTENT OF PHYSICAL POST HARVEST LOSSES OF IMPORTANT VEGETABLES OF VARANASI IN UTTAR PRADESH

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ABSTRACT

Vegetable based industries are the engine for economic growth and employment generation in rural areas, and they lay a solid foundation for the development of managerial capacity in the young and emerging entrepreneurs. In its recent report “Global food losses and food waste” the FAO suggests that roughly one-third of food production for human consumption is lost or wasted globally, which amounts of about 1.3 billion tons per year. Postharvest loss in fresh fruits and vegetables is estimated at 5-25% in developed countries and 20-50% in developing countries. Causes of this loss are varied with microbiological, mechanical and physiological factors being the main cause in perishable crops. To study the post harvest losses, the data were collected by personal interview from Whole saler, retailer, market intermediary and farmers of Varanasi district. Multi stage simple random sampling technique was adopted for the selection of respondents. **Averages and percentages** is used to compute the post-harvest losses. At producer level it is revealed that tomato and okra registered highest losses at the harvesting stage, while in pea, maximum loss was recorded at the handling and transportation stage. The remaining vegetables, viz. brinjal, cabbage and cauliflower registered maximum loss at the grading and packaging stage. At trader level losses at different stages were concerned, the maximum losses were estimated during the handling and transportation stage in most of crops, except cauliflower. The maximum loss during selling stage was registered in okra. Total post harvest losses reveals that post-harvest losses were maximum in tomato (22.01%) and minimum in cabbage (8.25%). Across different levels, it was found that the losses were maximum at the grower level in all the vegetables. The spoilage/loss of vegetables at the grower level results from lack of his knowledge about proper post-harvest management. Improper grading, packing, lack of storage and inadequate transportation facilities contribute more to the problem. One of the most important causes of post-harvest losses is harvest at inappropriate maturity, resulting in erratic ripening and poor quality. At the end, we conclude that the prospects of vegetables production in the state of Uttar Pradesh as a whole are dependent upon development of post harvest infrastructure, a good marketing system, producer welfare policies like Minimum Support Price (MSP) system which would ensure that the farmers are not incurring losses which ultimately prevent them from absconding vegetable production on their field.

KEYWORDS: Vegetables, Post Harvest Losses, Harvesting, Storage, Transportation Etc

INTRODUCTION

Vegetable based industries are the engine for economic growth and employment generation in rural areas, and they lay a solid foundation for the development of managerial capacity in the young and emerging entrepreneurs. In its recent report “Global food losses and food waste” the FAO suggests that roughly one-third of food production for human consumption is lost or wasted globally, which amounts of about 1.3 billion tons per year. Postharvest loss in fresh fruits and vegetables is estimated at 5-25% in developed countries and 20-50% in developing countries. Causes of this loss are varied with microbiological, mechanical and physiological factors being the main cause in perishable crops. Other causes

are in-adequate harvesting, packaging, handling skills and refrigerated storage, as well as inadequate transportation. Both quantitative and qualitative food losses of extremely variable magnitude occur at all stages in the post-harvest system from harvesting, through handling, storage, processing and marketing to final delivery to the consumer. Postharvest loss results not only in the loss of the actual crop, but also have an impact on the environment, resources, labor needed to produce the crop and livelihood of individuals involved in the production process. The implementation of appropriate storage and postharvest techniques will add value to the produce and will increase the farmer's income. The present share of Uttar Pradesh in total horticulture production of the country is approximately 26%. U.P. ranks second in vegetable and first in potato production among all states. The major vegetables grown in the state are, peas, chilies, okra, tomato, brinjal, cauliflower, cabbage, spinach, melon, radish, carrot, turnip and cucurbits. The major vegetables grown in the Varanasi district are potato, onion, tomato, cabbage, cauliflower, brinjal, etc. There are several factors which causes losses in vegetable after harvesting and ultimately increase the cost of production and decrease the quality of produce also. Postharvest losses are caused by both external and internal factors. External factors are Mechanical Injury and parasitic Diseases and Internal factor is Physiological Deterioration. Various types of spoilage are- Physical spoilage, Physiological aging, Spoilage due to insects or rodents, Mechanical damage, Chemical and enzyme spoilage, Microbial spoilage. Objectives :To study the extent of physical post harvest losses of important vegetables,

Madan and Ullasa (1991) conducted a survey in mango orchards, markets and processing units in Karnataka, India, to determine the extent and causes of postharvest losses in mango. The technology to reduce postharvest losses had not been used by the farmers and other participants in the mango marketing system (<1% of the total income from an orchard was spent on plant protection measures by farmers). Postharvest losses of up to 4% were estimated at the processing end of the marketing system. The major cause of losses were identified as postharvest diseases including stem-end-rot, anthracnose, *Aspergillus* and *Rhizopus* rots. It is suggested that these losses could be reduced by following the recommended technology. Costa *et al.* (1996) analysed the economic effects of post-harvest losses for tomatoes in Brazil in particular during transport and marketing. The three main players in the marketing chain are examined: producer, middle man and retailer. The retailer has the most bargaining power as they pay higher prices for better quality. The variations in price, quantity, revenue and margins in relation to the increase in transport and marketing losses were analysed along with changes in demand and supply elasticities.

METHODOLOGY

To study the post harvest losses, the data were collected by personal interview from Whole saler, retailer, market intermediary and farmers of Varanasi district. Multi stage simple random sampling technique was adopted for the selection of respondents. To meet the objective of present study, primary data were collected on post harvest losses i.e. after harvesting, storage, loading and unloading and during transportation by using well designed and pre tested schedule. The total postharvest losses is estimated as a sum of all these losses. **Averages** and **percentages** is used to compute the post-harvest losses.

RESULTS

The post-harvest losses were estimated first at producer level, and then at trader level. The losses at producer level have been estimated at different stages, viz. harvesting, grading & packing, handling & transportation and marketing; whereas the losses at trader level have been estimated at loading-unloading, transportation, grading and selling stages.

The results of the analysis have been presented in Tables 1 to 3.

Post-Harvest Losses in Vegetables at Producer Level

The post-harvest losses at producer level have been tabulated in Tables . Post harvest losses at producer levels is high in India due to illiteracy and improper harvesting and handling techniques.

It is shown by Table 1.

As it is evident from Table 1 above that the post-harvest losses in vegetables are at producer level which was maximum in tomato (14.31%), followed by okra (11.16%) and brinjal (9.57%). The cabbage and radish registered the lowest post-harvest losses of 5.45 per cent and 7.43 per cent, respectively. Among different stages, it is revealed that tomato and okra registered highest losses at the harvesting stage, while in pea, maximum loss was recorded at the handling and transportation stage. The remaining vegetables, viz. brinjal, cabbage and cauliflower registered maximum loss at the grading and packaging stage.

Post-Harvest Losses in Vegetables at Trader Level

It is shown by table 2

In this section the post-harvest losses at the wholesale and retail levels have been discussed. The wholesale transactions in vegetables were being performed from early morning till around 11 am every day. The wholesaler-cum-commission agents were found not taking title in the case of green vegetables in the study area, except in potato and onion. The functionaries informed that they lost up to 10 per cent in potato and 7 per cent in onion during storage and about half of the quantity was sold without storing for a long period. Therefore, the half of these losses, viz. 5 per cent and 3.5 per cent were considered the losses at wholesale level for potato and onion, respectively. The losses at retail level were also worked out and have been presented in **Table 2**. It was found that loss was registered maximum by tomato (7.70%), followed by okra (6.64%), chilli (6.00%), capsicum (5.86%), brinjal (5.71%), chilli (5.27%), radish (5.25%), cauliflower (3.94%), and cabbage (2.80%). As far as losses at different stages were concerned, the maximum losses were estimated during the handling and transportation stage in most of crops, except cauliflower. The maximum loss during selling stage was registered in okra.

Total Post Harvest Losses of Vegetables

It is shown by table 3

The aggregate post-harvest losses in sample vegetables were calculated by taking together the losses at producer level, wholesale level and retail level. Table 3 reveals that post-harvest losses were maximum in tomato (22.01%) and minimum in cabbage (8.25%). Across different levels, it was found that the losses were maximum at the grower level in all the vegetables.

Table 1: Post-Harvest Losses in Vegetables at Producer Level

Vegetables	Total Production	Stages				Total Losses
		Harvesting	Grading & Packing	Handling & Transportation	Marketing	
Tomato	1728.54	114.24 (6.60)	24.50 (1.41)	106.60 (6.16)	2.16 (0.124)	247.50 (14.31)
Okra	42.46	2.63 (6.19)	1.63 (3.83)	0.48 (1.13)	—	4.74 (11.16)
Cauliflower	80.92	0.93 (1.14)	1.71 (2.11)	2.63 (3.25)	1.08 (1.33)	6.35 (7.84)
Brinjal	206.35	7.84 (3.79)	9.16 (4.43)	2.76 (1.33)	—	19.76 (9.57)
Cabbage	90.00	1.90 (2.11)	0.70 (0.77)	2.13 (2.36)	0.18 (0.20)	4.91 (5.45)
Capsicum	63.22	2.36 (3.73)	0.32 (0.50)	2.01 (3.17)	1.06 (1.67)	5.75 (9.09)
Radish	32.8	1.42 (4.32)	— (—)	0.80 (2.43)	0.22 (0.67)	2.44 (7.43)
Chilli	38.25	1.32 (3.45)	0.36 (0.94)	1.12 (2.92)	0.68 (1.77)	3.48 (9.09)
Pea	36.60	0.33 (0.91)	0.86 (2.34)	1.66 (4.53)	— (—)	2.85 (7.78)

Note: Figures in parentheses show percentage to total production and quantity in quintal

Table 2: Post-Harvest Losses in Vegetables at Trader Level

Vegetables	Total Quantity Handled	Stages				Total Losses
		Storage	Grading & Packing	Handling & Transportation	Marketing	
Tomato	12.10	— (—)	0.092 (0.76)	0.820 (6.77)	0.020 (0.16)	0.932 (7.70)
Cauliflower	10.58	0.140 (1.32)	0.056 (0.52)	0.120 (1.13)	0.101 (0.95)	0.417 (3.94)
Cabbage	9.25	0.043 (0.46)	0.044 (0.46)	0.112 (1.21)	0.060 (0.64)	0.259 (2.80)
Pea	8.76	0.071 (0.81)	0.06 (0.68)	0.130 (1.48)	0.201 (2.29)	0.462 (5.27)
Chilli	2.40	0.012 (0.50)	0.018 (0.75)	0.082 (3.14)	0.032 (1.33)	0.144 (6.00)
Radish	2.40	— (—)	0.015 (0.62)	0.102 (4.25)	0.009 (0.37)	0.126 (5.25)
Capsicum	1.96	0.012 (0.61)	0.010 (0.51)	0.072 (3.67)	0.021 (1.07)	0.115 (5.86)
Okra	9.05	0.084 (0.92)	0.102 (1.12)	0.139 (1.53)	0.276 (3.04)	0.601 (6.64)
Brinjal	5.32	0.140 (2.63)	0.042 (0.78)	0.102 (1.91)	0.020 (0.37)	0.304 (5.71)

Note: Figures within the parentheses show percentage to total production and quantity in quintal

Table 3: Total Post-Harvest Losses in Vegetables

	Grower	Wholesaler	Retail	Total
Tomato	14.31	-	7.70	22.01
Cauliflower	7.84	-	3.94	11.78
Cabbage	5.45	-	2.80	8.25
Pea	7.78	-	5.27	13.05
Chilli	9.09	-	6.00	15.09
Radish	7.43	-	5.25	12.68
Capsicum	9.09	-	5.86	14.95
Okra	11.16	-	6.64	17.80
Brinjal	9.57	-	5.71	15.28
<i>Note:</i> All values are in percentages.				

The aggregate post-harvest losses in sample vegetables were calculated by taking together the losses at producer level, wholesale level and retail level. Table 3 reveals that post-harvest losses were maximum in tomato (22.01%) and minimum in cabbage (8.25%). Across different levels, it was found that the losses were maximum at the grower level in all the vegetables.

CONCLUSIONS

The study has examined the nature and extent of post-harvest losses in vegetable supply chain in the Varanasi district of Uttar Pradesh. The maximum aggregate post-harvest losses have been found in tomato, followed by okra, brinjal, chilly, and pea. The study has suggested that establishment of producer co-operatives to handle various activities relating to production and marketing of vegetables would help in reducing post-harvest losses. we conclude that the prospects of vegetables production in the state of Uttar Pradesh as a whole are dependent upon development of post harvest infrastructure, a good marketing system, producer welfare policies like Minimum Support Price (MSP) system which would ensure that the farmers are not incurring losses which ultimately prevent them from absconding vegetable production on their field.

Recommendation

Based on the findings of this study, the following recommendations are made for policy actions to reduce the post harvest losses thereby increasing the standard of living of the vegetable producers in Varanasi district of Uttar Pradesh.

- Provision of good storage facilities to store the produce that are harvested before they are being taken to the market. This will help to reduce the losses that occur at the farm level.
- Training initiatives on post harvest handling of perishable products like vegetables should be encouraged and follow ups, feedback and adoption measurement should be conducted periodically for sustainability.
- Roads linking farms to market should be improved to reduce transit losses.
- Establishment of farmers market and cooperative marketing should be encouraged to reduce losses related to marketing functions. Furthermore,
- Establishment of vegetable processing industry that vegetable can be preserved and utilised for long period.
- With the reduction of post harvest losses, food availability would be increased significantly without necessarily cultivating an additional hectare of land. This is absolutely essential to achieve food and nutrition security in

INDIA by 2020.

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